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SCIENCE

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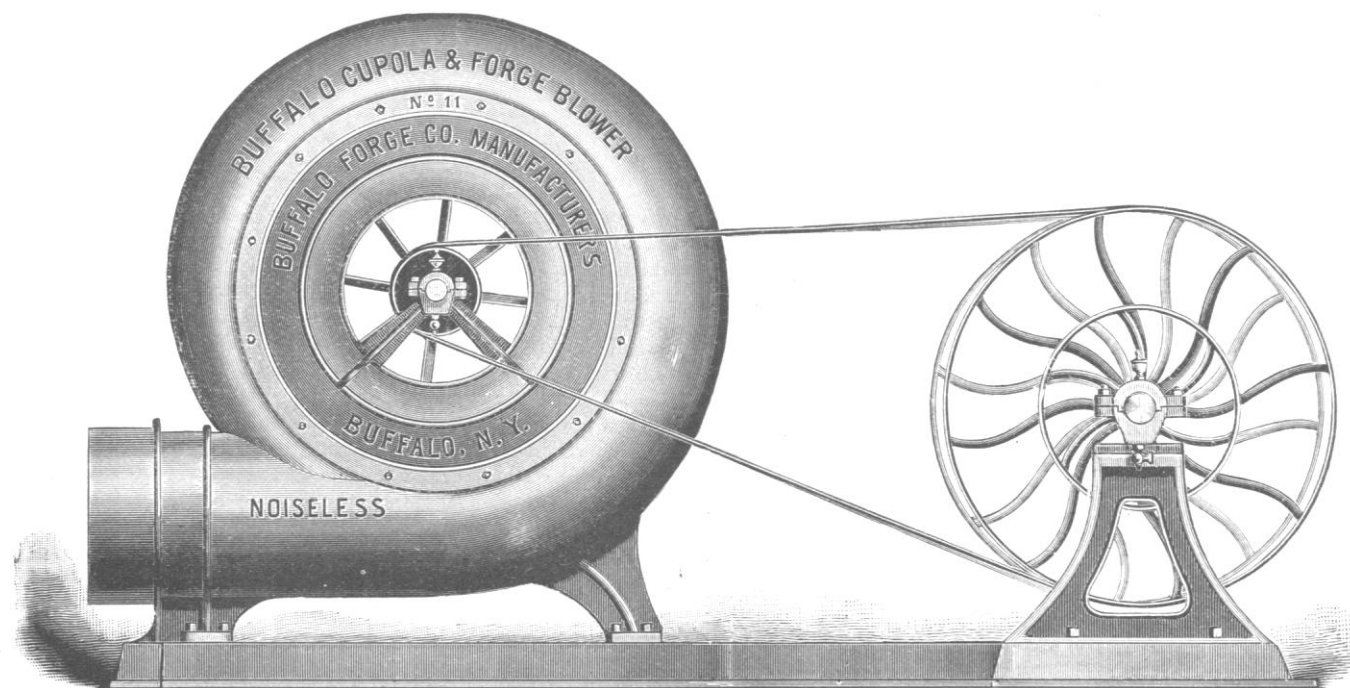
A STEEL PRESSURE-BLOWER.

THE annexed engraving illustrates a steel pressure-blower on a recently perfected pattern of adjustable bed with countershaft, designed and constructed with special reference to high-pressure duty, such as supplying blast for cupola furnaces, forge-fires, and sand-blast machines, also for forcing air long distances. By means of a tightening-screw, the blower may be moved upon the bed while running at full speed, taking up any slack, giving both belts a uniform tension, which is regulated at the will of the operator. This is a very important point in preventing the inconvenience and loss incurred by a stoppage during heat when blowers are used for cupola purposes. By the use of this adjusting device, a great saving is made in the wear and tear of belts, for a simple turn or two

stretches with immunity from heat or cutting. A distinguishing feature of these blowers is the solid case, the peripheral portion of the shell being cast in one solid piece, thus dispensing with objectionable joints. The journals are long and heavy, and have cap-bearings secured by bolts held firmly in place by lock-nuts. It is made by the Buffalo Forge Company, Buffalo, N. Y.

THE TOBACCO-PLANT.

AFTER the cereals, there is perhaps no plant so extensively cultivated and utilized as the tobacco-plant. It is grown and employed as a narcotic in almost every country of the world, and it has been calculated that one-fourth of the human family use it.



A STEEL PRESSURE-BLOWER.

of the nut on the adjusting-screw, and a retightening of the holding-down bolts, take but a moment, and accomplish the same end as relacing the belts, which usually is put off until the belt will run no longer on account of slack. Special attention should be directed to pressure-blower belts, on account of the high rate of speed at which they must necessarily run; and absolutely perfect alignment of the countershaft with the blower is essential in order to secure smooth running and even tracking, as well as to avoid undue wear of belts by slipping.

A telescopic mouth-piece is employed on this blower, in order that the piping may not be disarranged in moving the machine on the bed, and the countershaft is long enough to carry tight and loose pulleys for the main driving-belt. A self-oiling device fitted to the countershaft enables it to be run at high speeds for long

At the Colonial Exhibition in London, according to the *Journal of the Society of Arts*, the dried leaf and its preparations were shown by India and every one of the British possessions, and the Paris Exhibition has supplemented this display by showing its extensive production in Europe, North and South America, eastern Asia, the Pacific Islands, and the continent of Africa.

It is somewhat difficult to obtain trustworthy information regarding the world's trade in tobacco, because so much is used up locally in different countries. It is probable that the total area under cultivation is not far short of 6,000,000 acres. For the year 1886 certain official returns are available, which show that the United States, India, and Hungary are the largest producers.

The area under tobacco in acres was, in the United States, 752,520; India, 641,000; Hungary and Austria, 149,468; Germany,

49,312; France, 37,156; Algeria, 20,478; Italy, 12,061; Holland, 3,218, — a total of 2,106,213 acres.

The consumption of tobacco in the United Kingdom is large and progressive, and the revenue derived from it last year was nearly \$43,750,000. The average consumption is largest in Holland, — nearly 7 pounds per head; in the United States, about 4½ pounds; in Hungary, Denmark, Belgium, and Germany, from 3 to 3½ pounds. In the Australian colonies it is also high, — 3½ pounds; in France it is about 2 pounds; and in the United Kingdom, under 1½ pounds.

The yearly production of tobacco in Cuba is about 300,000 bales, and 181,000,000 cigars are also exported. The Spaniards have hitherto monopolized the trade in cigars, alleging that parts of the soil of Cuba were alone suited to the production of Havana tobacco. This assertion is now disproved, for with good choice of seed, soil, and leaf, and skilled manufacture, Jamaica is said now to send into the market as excellent a cigar as was ever shipped from Havana, and at a far cheaper rate. In the Philippines 100,000 hundred-weights of tobacco are produced. The Dutch possessions in the Eastern Archipelago ship a large quantity of excellent tobacco, which is held in high repute in Europe. The imports of Sumatra tobacco in Holland now average 140,000 bales; and of Java tobacco, 130,000 bales.

Although there are about fifty species of the genus *Nicotiana* known, only three or four are much cultivated for the leaf. The two principal commercial forms are by some botanists treated as varieties, and not as distinct species. These are *N. tabacum*, the most extensively cultivated kind of plant, which may be at once recognized by its longish pink flowers and tapering oval-lanceolate sessile leaves; and *N. rustica*, which has short greenish flowers, and stalked ovate, cordate leaves. The leaves are coarser and more crumpled than those of the preceding. This is popularly known as the Turkish form, but is most probably a native of Mexico and California. *N. repanda* is not very extensively cultivated, but is said to yield some of the finest qualities of Cuban tobacco. *N. Persica* furnishes the Persian or Shiraz tobacco. *N. angustifolia*, a species found in Chili, yields a very strong tobacco.

The West Indian, Latakia, and American tobaccos are obtained from cultivated plants of *N. tabacum*; while the Manila, Turkish, and Hungarian are reported to be derived from *N. nistica*. In India *N. rustica* is only cultivated to a very limited extent, and chiefly in eastern Bengal and Cachar, and the leaf is never exported to Europe. *N. tabacum* has become an abundant weed in many parts of India. The gross annual value of the tobacco harvest in Bengal may be roughly estimated at \$10,000,000, but the quantity exported is small, averaging only \$65,000 in value.

Of the species, *N. macrophylla* is considered to possess the qualities that distinguish a good tobacco in the highest degree. Some of the Havana tobaccos belong to this species. Madras, where the climate is admirably suited for the growth of tobacco, stands first with regard to the development of this industry in India. Dinnigul is the great tobacco district, and cheroots are manufactured at Trichinopoly. The islands in the delta of the Godavary also yield what is called Lunk tobacco, the climate being suitable; and the plants are raised in rather poor light soil, highly manured and well watered. No better evidence could be afforded of the universal use of this plant than the extensive display which was made of it in every section of the Paris Exhibition; and although most of the cases were under seal of the customs, yet many of the kiosks were privileged to sell, such as the Dutch, Belgian, Spanish, Mexican, etc., although the sale and manufacture is a government monopoly in France, and licenses are only granted to privileged people.

WHAT STANLEY HAS DONE FOR THE MAP OF AFRICA.¹

IT is nineteen years this month since Stanley first crossed the threshold of Central Africa. He entered it as a newspaper correspondent to find and succor Livingstone, and came out burning with the fever of African exploration. While with Livingstone at Ujiji he tried his 'prentice hand at a little exploring work, and be-

tween them they did something to settle the geography of the north end of Lake Tanganyika. Some three years and a half later he was once more on his way to Zanzibar, this time with the deliberate intention of doing something to fill up the great blank that still occupied the centre of the continent. A glance at the first of the maps which accompany this paper will afford some idea of what Central Africa was like when Stanley entered it a second time. The ultimate sources of the Nile had yet to be settled. The contour and extent of Victoria Nyanza were of the most uncertain character. Indeed, so little was known of it beyond what Speke told us, that there was some danger of its being swept off the map altogether, not a few geographers believing it to be not one lake, but several. There was much to do in the region lying to the west of the lake, even though it had been traversed by Speke and Grant. Between a line drawn from the north end of Lake Tanganyika to some distance beyond the Albert Nyanza on one side, and the west coast region on the other, the map was almost white, with here and there the conjectural course of a river or two. Livingstone's latest work, it should be remembered, was then almost unknown, and Cameron had not yet returned. Beyond the Yellala Rapids there was no Kongo, and Livingstone believed that the Lualaba swept northwards to the Nile. He had often gazed longingly at the broad river during his weary sojourn at Nyangwé, and yearned to follow it, but felt himself too old and exhausted for the task. Stanley was fired with the same ambition as his dead master, and was young and vigorous enough to indulge it.

What, then, did Stanley do to map out the features of this great blank during the two years and nine months which he spent in crossing from Bagamoyo to Boma, at the mouth of the Kongo? He determined, with an accuracy which has since necessitated but slight modification, the outline of the Victoria Nyanza; he found it to be one of the great lakes of the world, 21,500 square miles in extent, with an altitude of over 4,000 feet, and border soundings of from 330 to 580 feet. Into the south shore of the lake a river flowed, which he traced for some 300 miles, and which he set down as the most southerly feeder of the Nile. With his stay at the court of the clever and cunning Mtesa of Uganda we need not concern ourselves; it has had momentous results. Westwards he came upon what he conceived to be a part of the Albert Nyanza, which he named Beatrice Gulf, but of which more anon. Coming southwards to Ujiji, Stanley filled in many features in the region he traversed, and saw at a distance a great mountain, which he named Gordon Bennett, of which also more anon. A little lake to the south he named Alexandra Nyanza; thence he conjectured issued the south-west source of the Nile, but on this point, within the last few months, he has seen cause to change his mind. Lake Tanganyika he circumnavigated, and gave greater accuracy to its outline; while through the Lukuga he found it sent its waters by the Lualaba to the Atlantic. Crossing to Nyangwé, where with longing eyes Livingstone beheld the mile-wide Lualaba flowing "north, north, north," Stanley saw his opportunity, and embraced it. Tippu-Tip failed him then, as he did later; but the mystery of that great river he had made up his mind to solve, and solve it he did. The epic of that first recorded journey of a white man down this majestic river, which for ages had been sweeping its unknown way through the centre of Africa, he and his dusky companions running the gauntlet through a thousand miles of hostile savages, is one of the most memorable things in the literature of travel. Leaving Nyangwé on Nov. 5, 1876, in nine months he traced the many-islanded Kongo to the Atlantic, and placed on the map of Africa one of its most striking features. For the Kongo ranks among the greatest rivers of the world. From the remote Chambeze that enters Lake Bangweolo to the sea, it is 3,000 miles. It has many tributaries, themselves affording hundreds of miles of navigable drains; waters a basin of a million square miles, and pours into the Atlantic a volume estimated at 1,800,000 cubic feet per second. Thus, then, were the first broad lines drawn towards filling up the great blank. But, as we know, Stanley two years later was once more on his way to the Kongo, and shortly after, within the compass of its great basin, he helped to found the Kongo Free State. During the years he was officially connected with the river, either directly or through those who served under him, he went on filling up the blank by the exploration of other rivers,

¹ J. Scott Keltie, in *Contemporary Review*, January, 1890.